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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,659	08/19/2003	Matthew O'Donnell	UOM 0276 PUSP	5262

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EXAMINER	
KISH, JAMES M	

ART UNIT	PAPER NUMBER
3737	

DATE MAILED: 09/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/643,659	O'DONNELL ET AL.	
	Examiner	Art Unit	
	James Kish	3737	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-52 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1,2,4-9,13-19,21-26,28-33,37-43 and 45-52 is/are rejected.

7)☒ Claim(s) 3,10-12,20,27,34-36 and 44 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 19 August 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date 9/2/03, 2/2/04.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-2, 4-8, 17-18, 21-26, 28-32, 41-42 and 45-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sliwa, Jr. et al. (US Patent No. 5,749,364) in view of Mackinnon et al. (US Patent No. 6,546,272). Sliwa discloses a method of mapping fluid pressure information within a living body utilizing changes in acoustic behavior of microbubbles. It is also possible to use this information to assess the health of tissue (see Abstract). High frequency sound waves are applied to the region containing the microbubbles and an acoustic spectrum returned from the region (to a detector). A fluid pressure parameter is determined in response to at least one characteristic of the acoustic spectrum (column 3, lines 29-40). The pressure-related information is displayed in at least 2 dimensions (column 4, lines 56-63). Also, see column 3, line 65 through column 4, line 11 for discussion on evaluation of the health of bodily tissue. Sliwa uses an ultrasound transmitter to create the ultrasound wave. However, Mackinnon teaches an apparatus for in vivo imaging of internal organs. In one technique, a laser (with a focused beam; column 5, lines 33-35) is directed into tissue to create a microbubble of gas or plasma. When the bubble collapses, an ultrasound pulse is generated which is measured by a piezoelectric crystal detector

(column 5, line 65 through column 6, line 2). Therefore, it was known in the art at the time the invention was made that a laser is capable of creating both microbubbles and ultrasonic waves that can be detected. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a laser, as taught by Mackinnon, either in combination with or as an alternative to an ultrasound emitter to cause an acoustic wave associated with a microbubble to propagate in a volume of interest and be detected and analyzed to evaluated pressure of the surrounding environment, as disclosed by Sliwa, in order to remove the need of prefabricating microbubbles using polymers (Sliwa: column 1, lines 37-42).

With regard to claims 21-22 and 45-46 see column 1, line 55 through column 2, line 10, as well as column 2, lines 31-35 of Sliwa.

With respect to claims 4 and 28, see column 6, lines 10-26 of Sliwa.

Claims 19 and 43 rejected under 35 U.S.C. 103(a) as being unpatentable over Sliwa, Jr. et al. in view of Mackinnon et al. as applied to claims 1-2, 4-8, 17-18, 21-26, 28-32, 41-42 and 45-52 above, and further in view of Esenaliev (US Patent No. 6,165,440). Sliwa in combination with Mackinnon teach the use of laser-induced microbubbles to create acoustic waves, which can be detected and analyzed, as descried above. However, neither reference includes ultrafast pulses or additives. Esenaliev teaches interaction of electromagnetic pulses with nanoparticles for enhancement of drug delivery (see Abstract). The pulses can be on the level of short (nanoseconds) or ultrashort (picoseconds) as described at column 6, lines 40-44. It

would have been obvious to one having ordinary skill in the art at the time the invention was made to use ultrafast laser pulses with the additives described by Esenaliev in the system of Sliwa/Mackinnon because porous particles with gas-filled pores can substantially lower cavitation threshold because they already have initial bubbles, thereby (column 10, lines 22-35).

Claims 9, 13-16, 33, and 37-40 rejected under 35 U.S.C. 103(a) as being unpatentable over Sliwa, Jr. et al. in view of Mackinnon et al. as applied to claims 1-2, 4-8, 17-18, 21-26, 28-32, 41-42 and 45-52 above, and further in view of Baker, Jr. et al. (US Patent No. 6,471,968). Sliwa in combination with Mackinnon teach the use of laser-induced microbubbles to create acoustic waves, which can be detected and analyzed, as descried above. However, neither reference includes nanodevices as part of an additive. Baker teaches a therapeutic and diagnostic array comprising nanodevices used for delivery of therapeutic agents (column 6, lines 49-67). For description of the device, see column 12. For therapeutic agents used with the device, see column 15. It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the nanodevices as taught by Baker into the system of Sliwa/Mackinnon in order to actively determine time and location of the distribution of therapeutic agents and to monitor the response to therapy of a cell or tissue (see Abstract).

Allowable Subject Matter

Claims 3, 10-12, 20, 27, 34-36 and 44 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Kish whose telephone number is 571-272-5554. The examiner can normally be reached on 8:30 - 5:00 ~ Mon. - Fri..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JMK

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